ConsoliDator+

MasterClass

Week 1 – Level Applications

Today's Key Topics

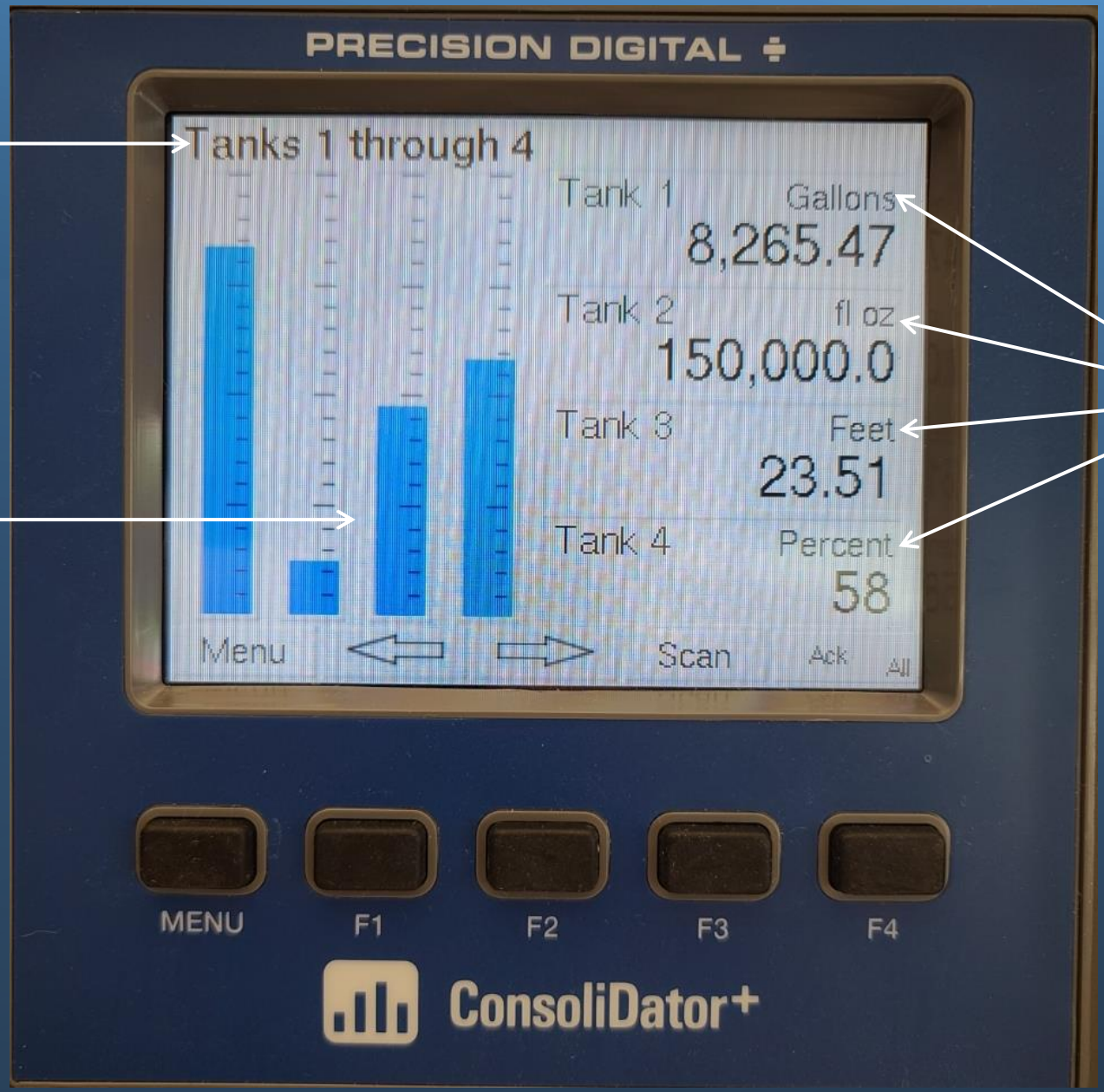
- Basic Level Monitoring
- Pump Control (duplex/triplex)
- Point Level Indication
- 5-Zone Bar Graphs
- Real-Life Application Example

ConsoliDator+

MasterClass

Each screen can be labeled to identify what is being shown!

The bar graphs on the screen gives customers visual indication of their tank heights!



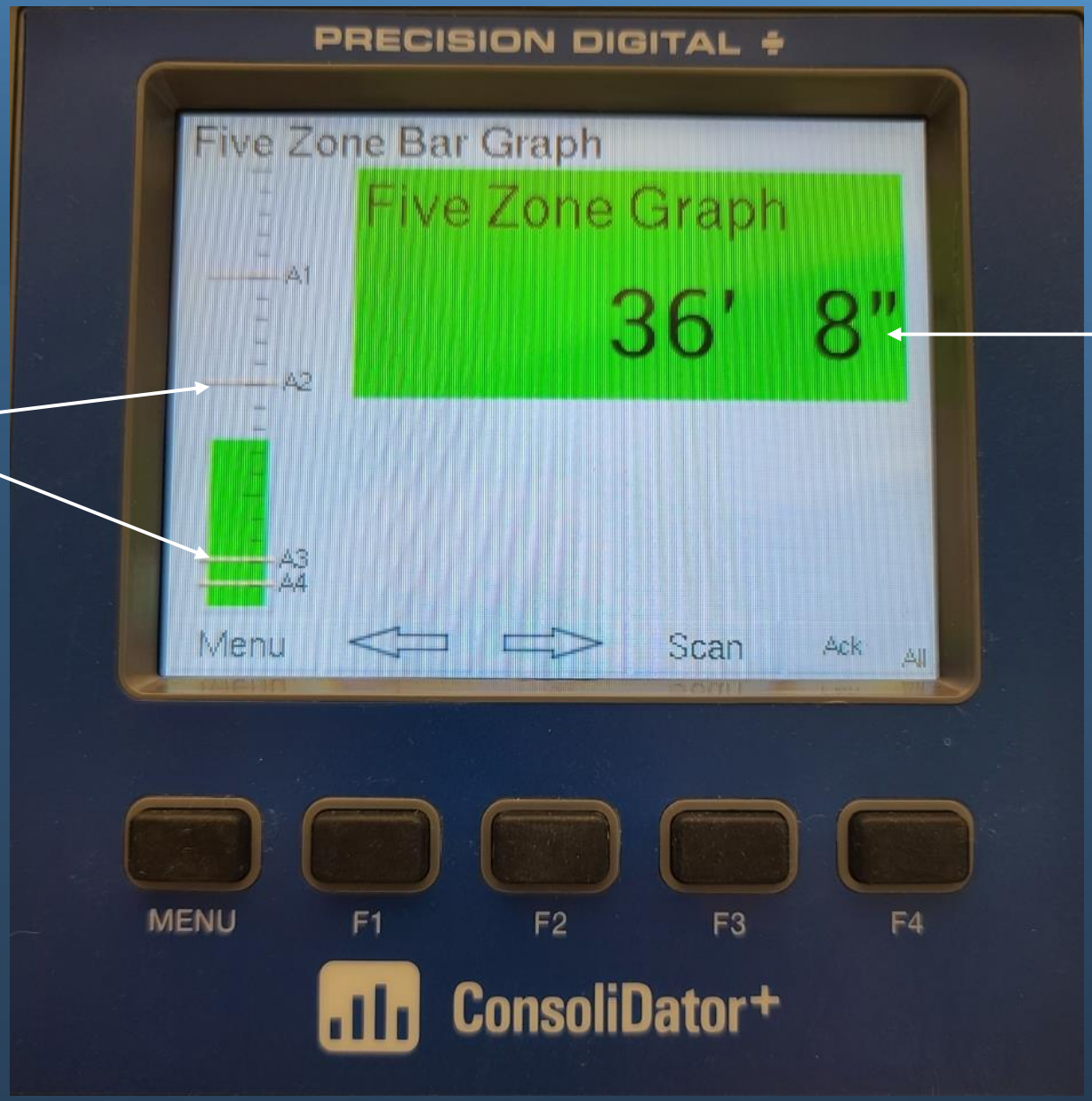
Each channel can be scaled and configured completely independently of each other.

You will notice how each tank is being measured in a unique engineering unit!

Let’s assume a customer would like to maintain their tank level between these two points…

When the level is where they want it, the bar graph and channel is indicated with the color GREEN…

But…

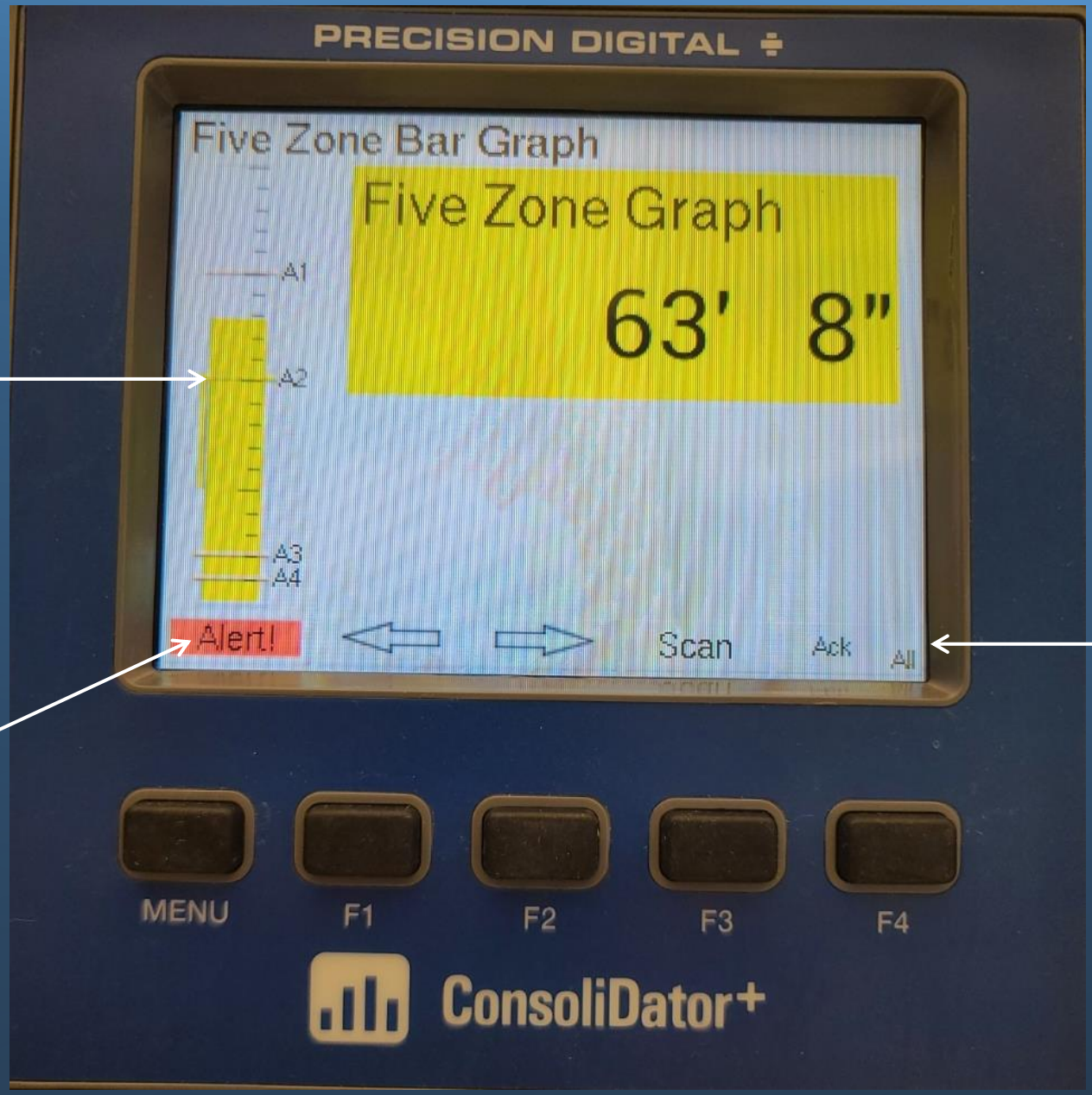


Also notice how the ConsoliDator+ is capable of displaying level in tank HEIGHT – Customers REALLY like that feature.

When talking to a customer about level, I usually ask them, “would you like to measure the volume, or the tank height?”

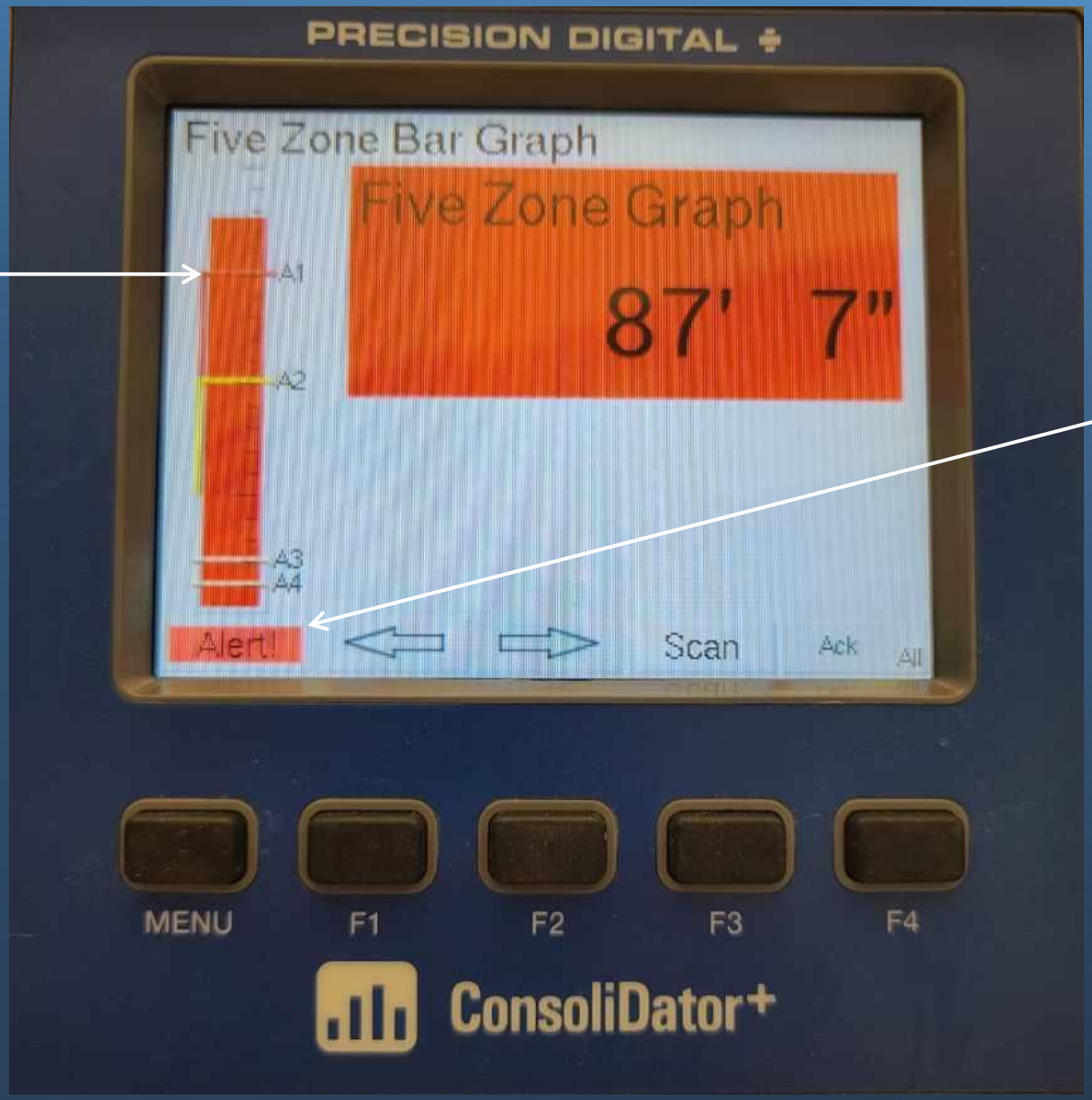
Once the tank level surpasses that “A2” alarm marker, the bar graph and channel information turn bright YELLOW…

Since an alarm is triggered, our “Alert!” button let’s us know something is wrong… (more on this later)



A “soft key” can be programmed on any screen to allow an operator to acknowledge an alarm which is especially useful if they have the alarm tied to an audible alarm that needs to be turned off while they address the issue.

If the level continues to rise, and it surpasses our “A1” alarm marker, the color of the bar graph and channel information will turn RED and FLASH to grab the operator’s attention



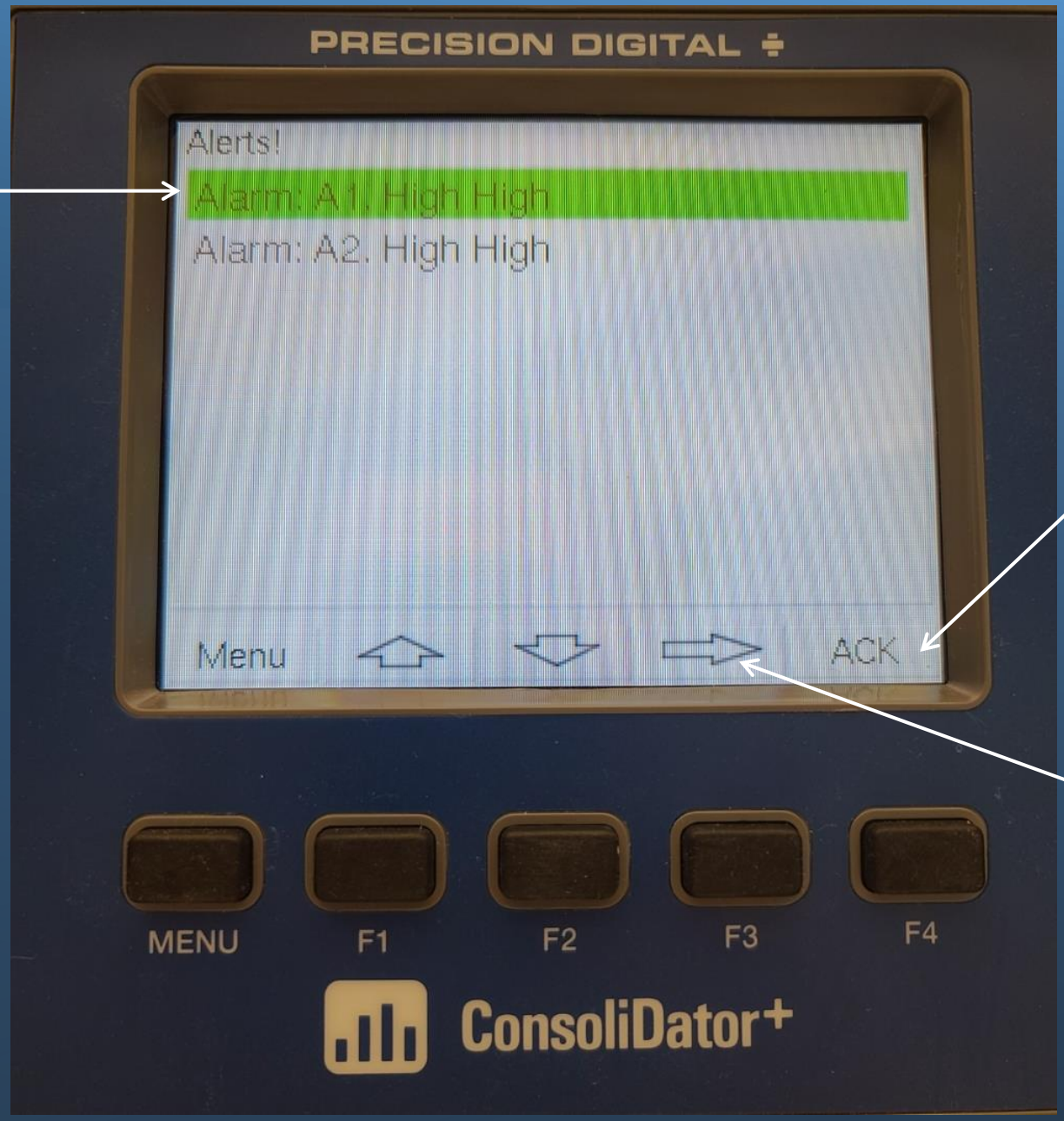
So, what’s this “Alert!” button all about?!

We can see that something is wrong right on the screen, right?

What’s the deal?

The “Alerts!” screen will list all alarms which are CURRENTLY active/triggered

You will notice how it is both the “A1” and “A2” alarms from the 5-zone bar graph screen which are active!



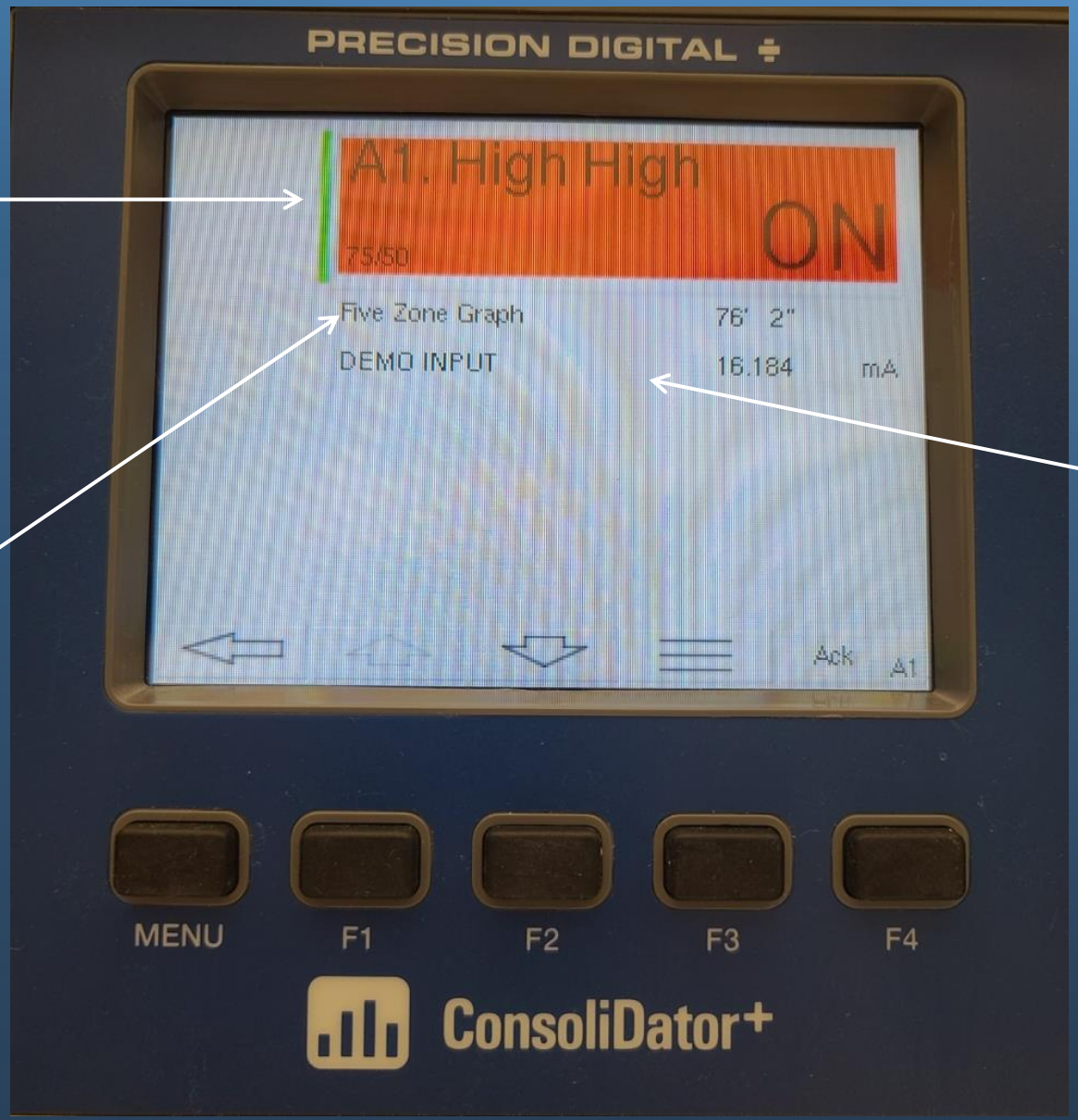
By using the “Up” and “Down” arrow keys, you can highlight a specific alarm, and choose to acknowledge the alarm right from this screen!

OR…

With an alarm highlighted, you could also press the “Right” arrow key to look at some additional information about the alarm…..(on the next slide)

This screen is showing you the “A1” alarm is ON and shows you the set and reset points of the alarm in the bottom left-hand corner of the red box

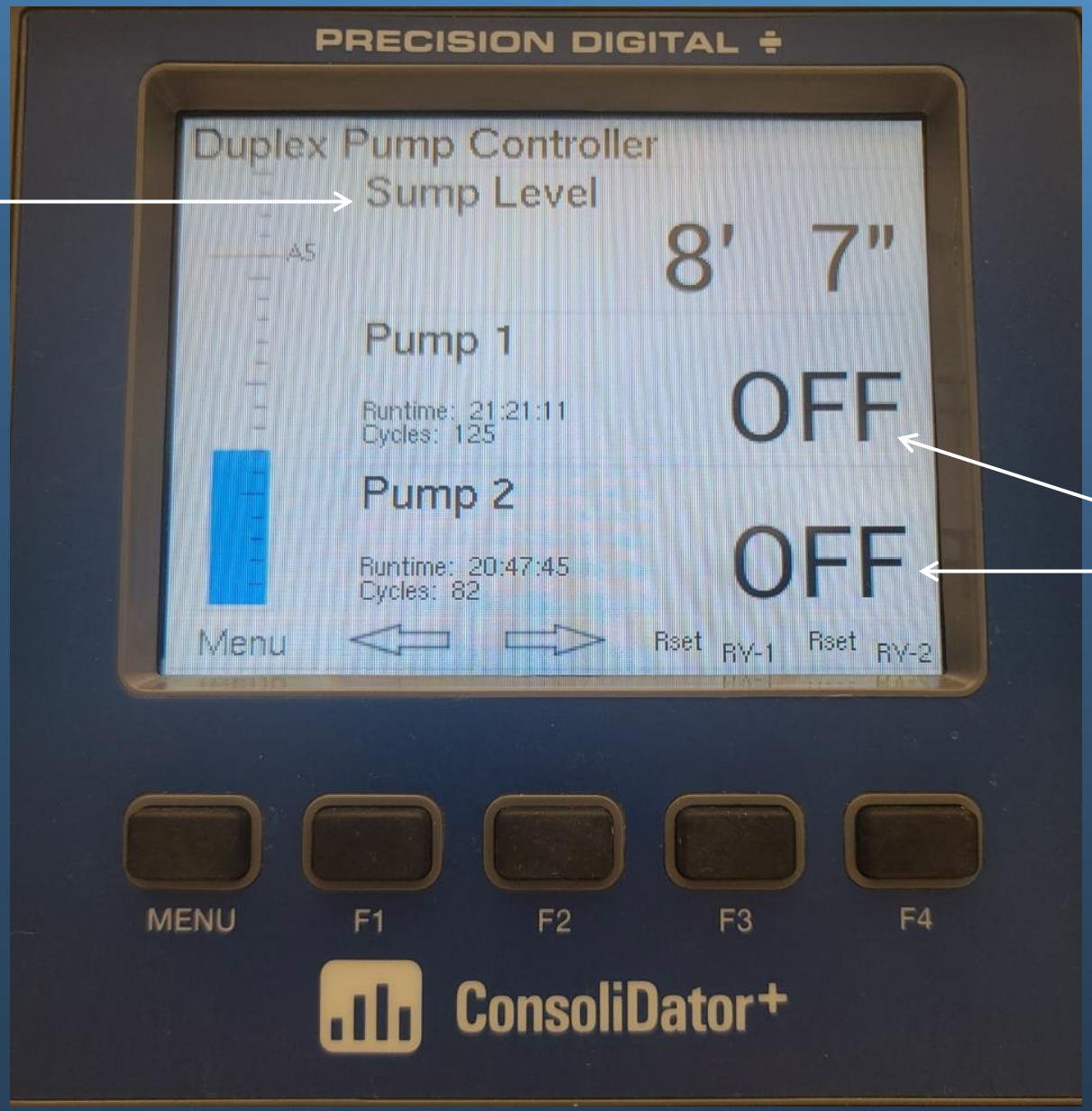
It will also tell you to which channel the alarm is tied, and gives you the current channel reading (76 feet 2 inches, in this case)



Lastly, it can show you exactly which INPUT is tied to the channel that is in alarm.

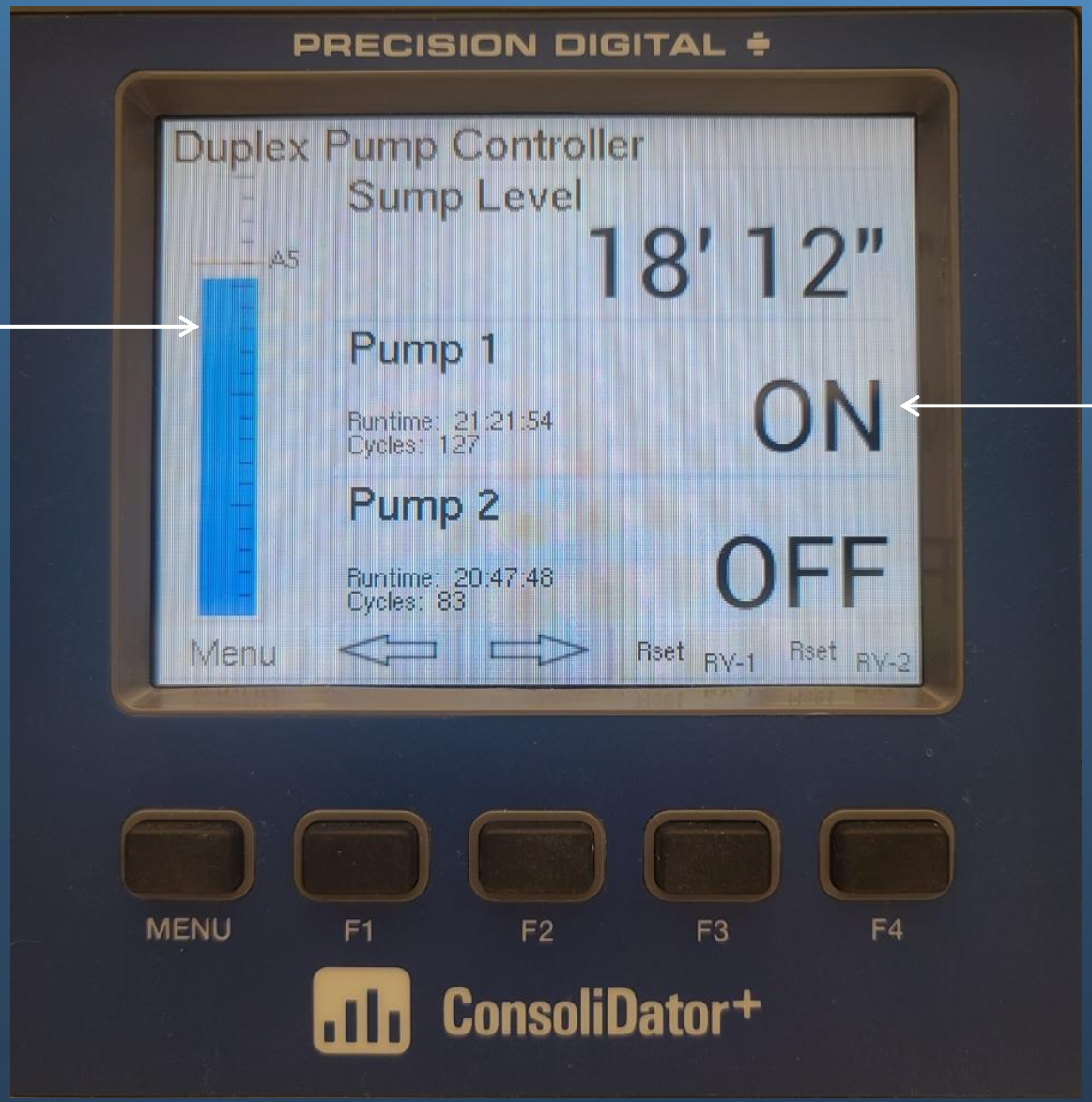
This is a major reason why it’s a good idea to LABEL YOUR INPUTS

On this screen, we are reading out the level of a sump in Feet and Inches – a VERY popular way to measure level!



The ConsoliDator+ can show you pump status and can also keep track of pump cycles and runtime!

As the level of the sump rises, and approaches our “A5” alarm marker, we want to pump out some of the material.



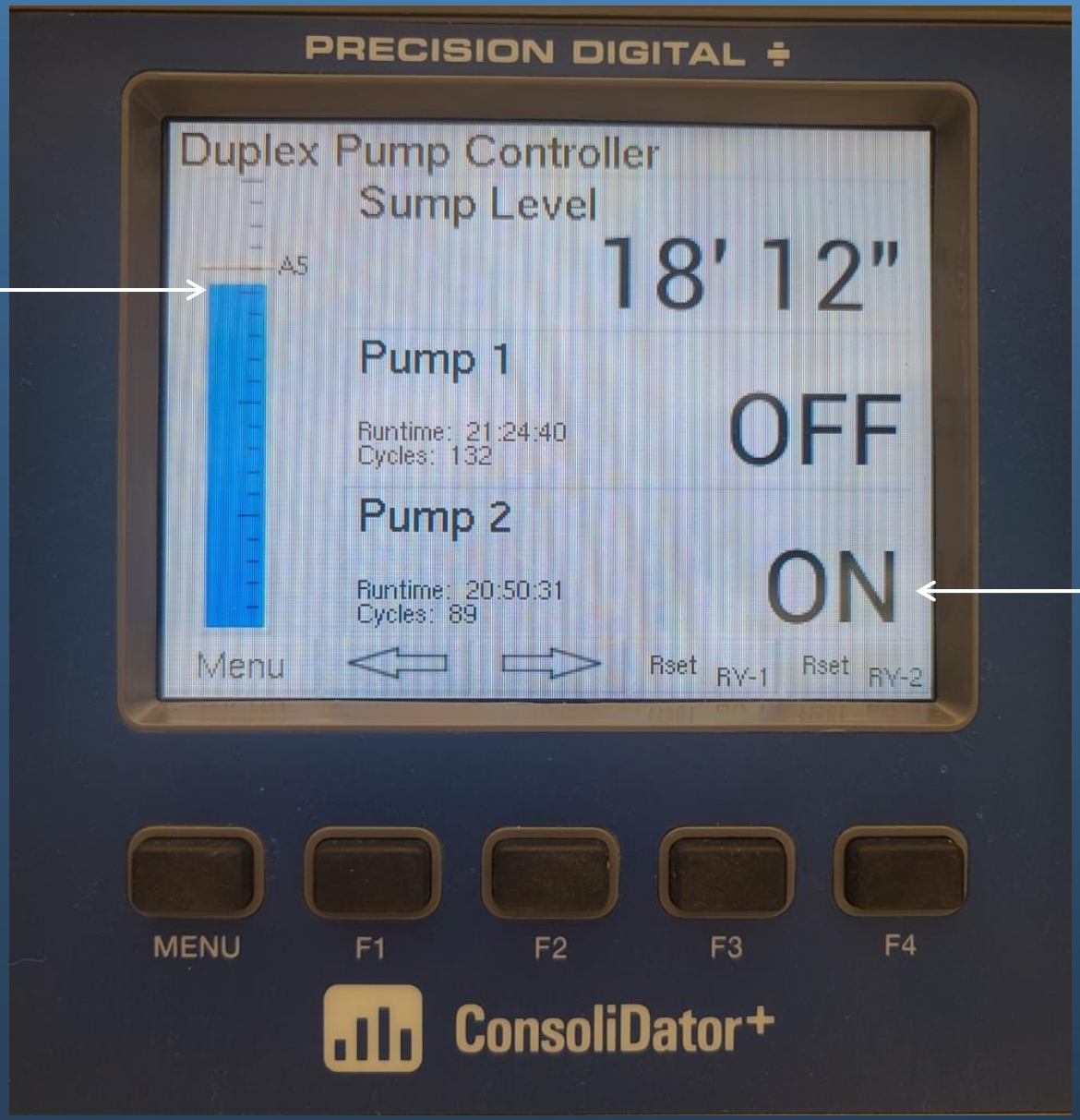
The first time we get to our setpoint, “Pump 1” turns on and begins running.

The pump will drain the sump and turn off.

The next time our level goes high, the pumps will alternate and it will be Pump 2’s job to drain the sump!

Notice how the level of our sump has not changed, even by an inch.

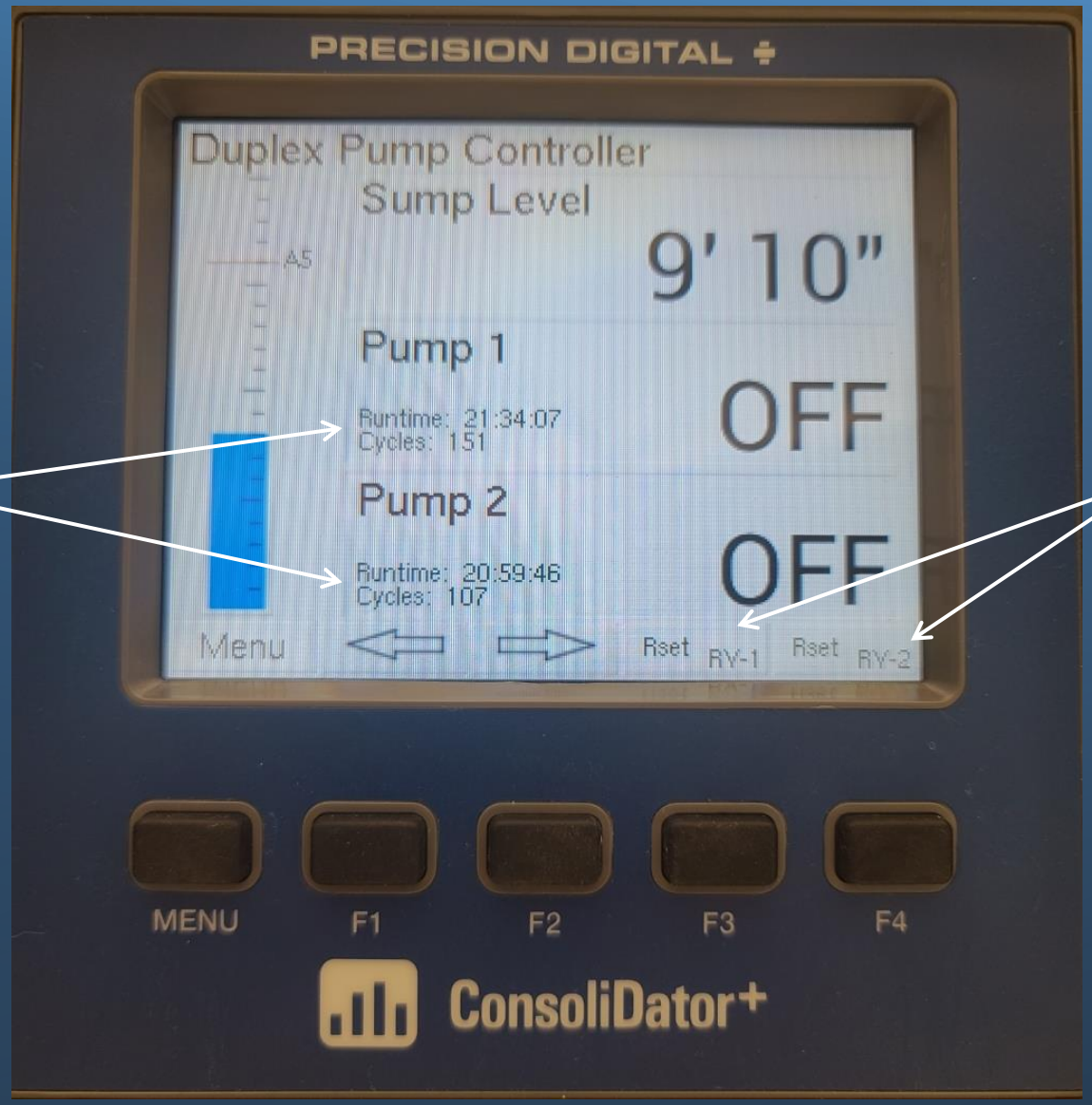
So, how come Pump 2 is the one running if our level is exactly the same?



One of the features that really makes the ConsoliDator+ shine is the ability to alternate pumps based on level AND/OR pump run time.

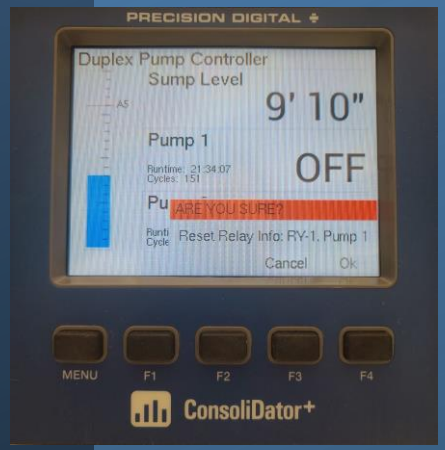
For this example, our pumps will alternate back and forth every 30 seconds, regardless of how much material is in the sump!

After a full day/week of pumps cycling back and forth, a lot of customers like to start their next day/week with a fresh start!



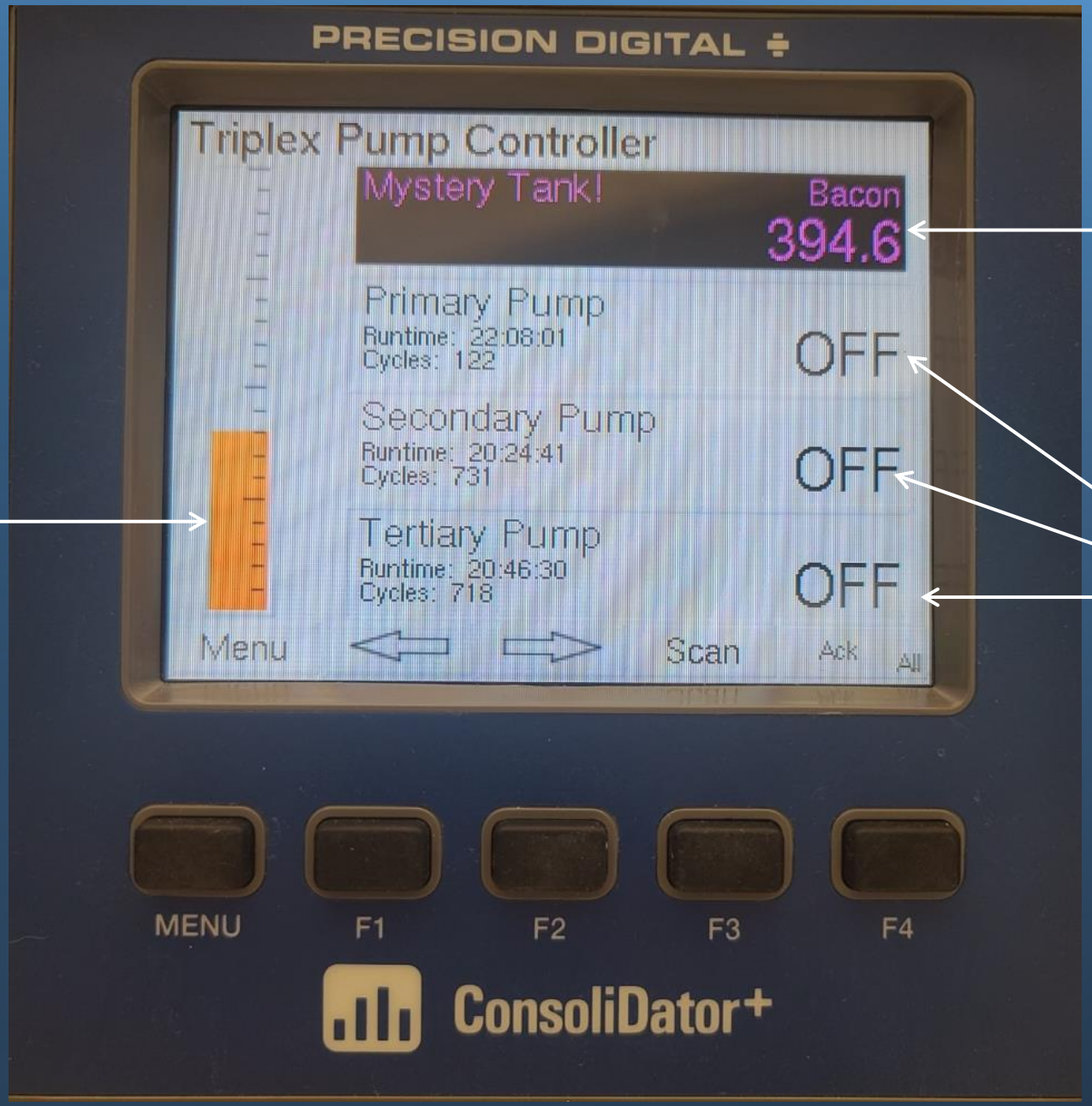
These “Soft Keys” are there to allow an operator to reset the “Runtime” and “Cycles” of “Pump 1” or “Pump 2”

Which will look like this…



As you can see, there are no active alarms, but our bar graph is orange.

That is because you can program the bar graphs to be any color you want “under normal operating conditions”



The ConsoliDator+ allows you to add totally custom engineering units. In this case, our “Mystery Tank” is being measured in “Bacon”… because who doesn’t love bacon, right?

The pump alternation works exactly the same as when we have two pumps. In this case, we will be alternating between THREE pumps based on tank level AND/OR pump runtime!

With our ProVu Series, you are able to do what's called "dual-scale".

This allows you to take ONE signal, and scale it in two different ways (volume and height, or gallons and percentage)

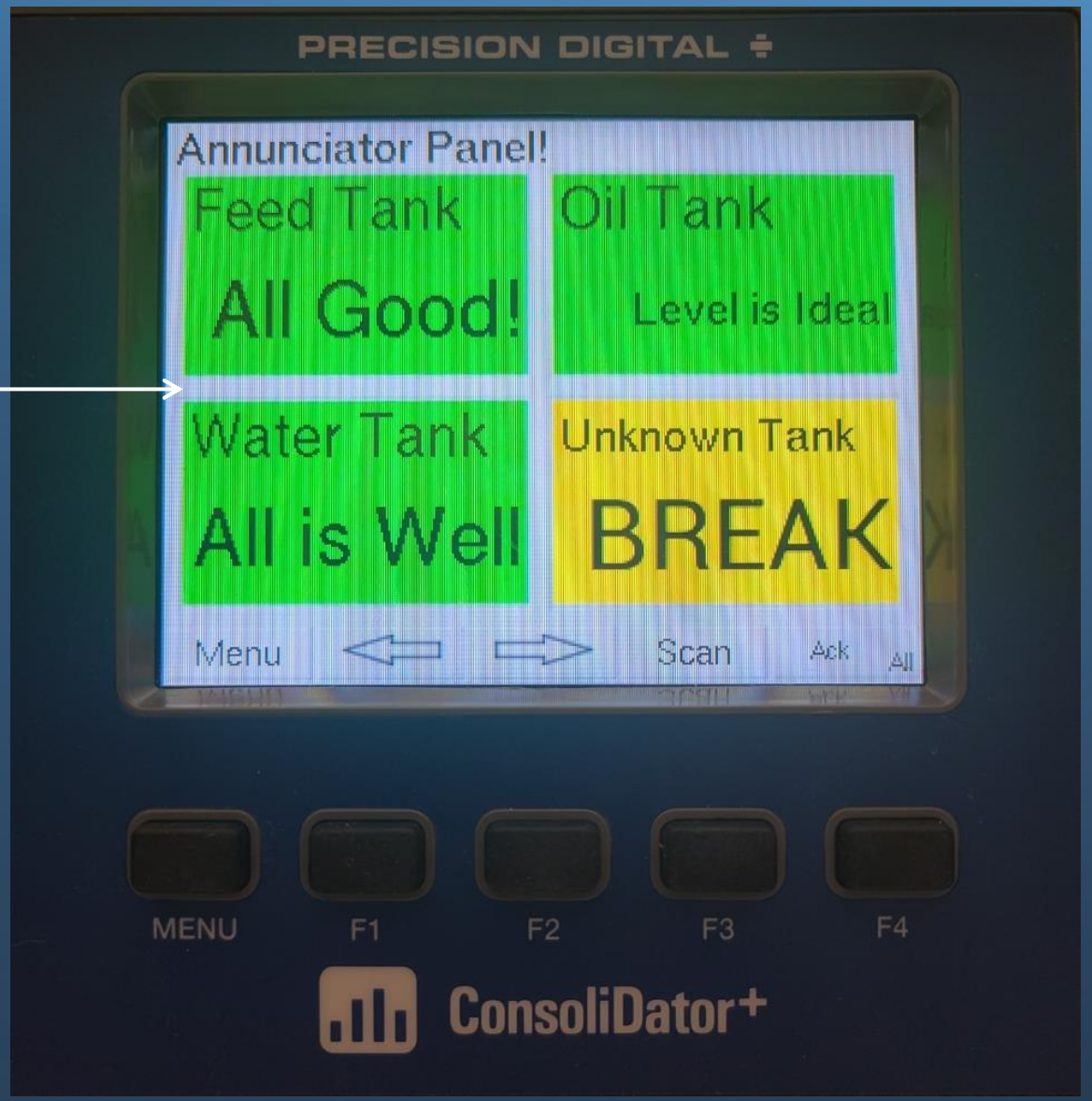
The ConsoliDator+ let's you do WAY more than just two readings per process signal

In this example, we only have four readings, but you COULD actually make 160 completely unique readings based off just ONE process signal

Now, the ConsoliDator+ does not HAVE TO display bar graphs on a screen.

In fact, this screen doesn't even have any level readings on it!

Just "level statuses".

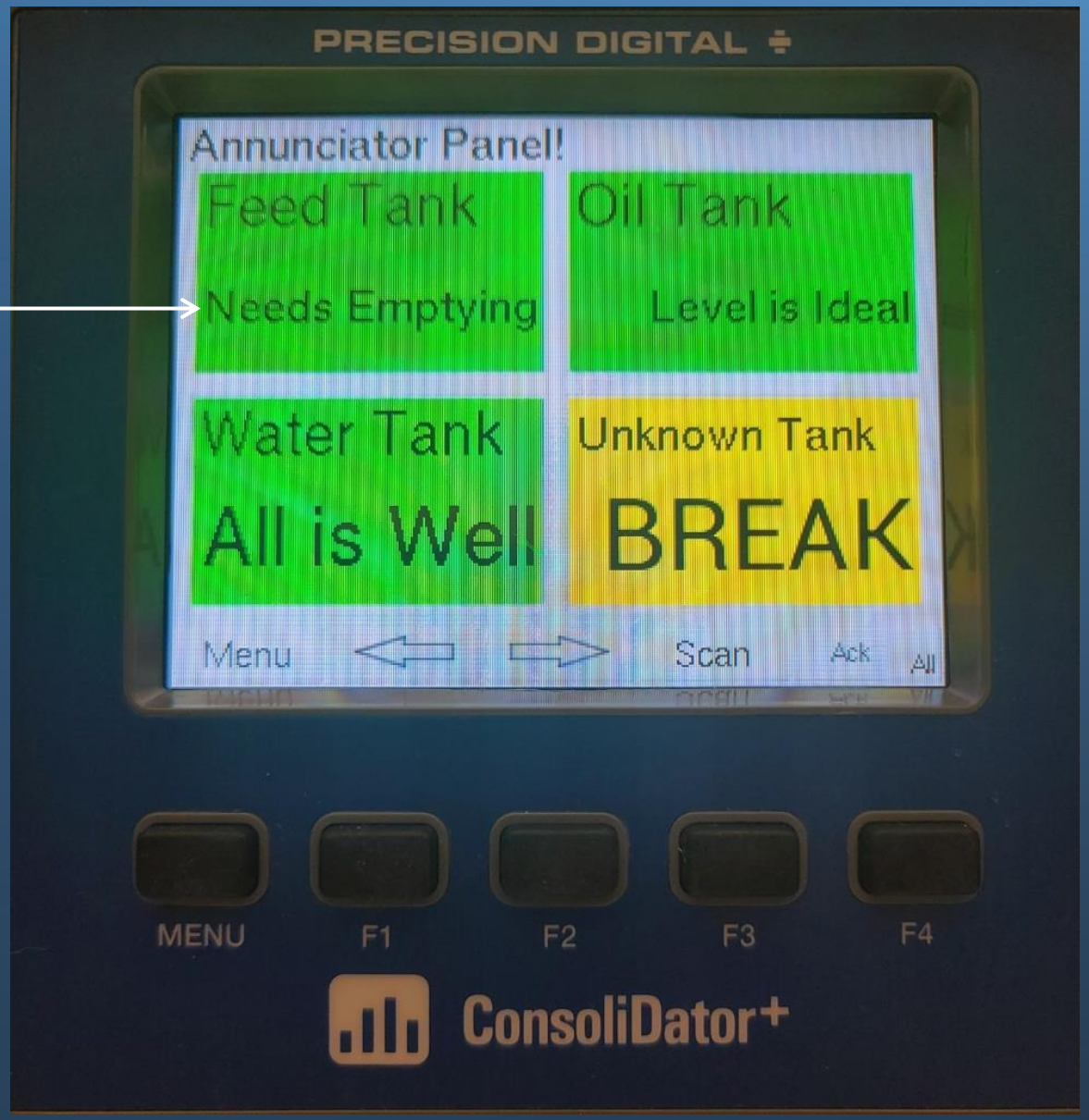


Rather than scaling an input to correspond to a certain volume of liquid, we can choose specific ranges within our 4-20 mA scale, and have the ConsoliDator+ display WORDS or PHRASES instead of numbers!

You will also notice, when a channel goes into alarm for any reason (in this case, signal loss) the channel itself can be programmed to change color which will draw attention to the error!

Our “Feed Tank” went from “All Good!” to “Needs Emptying” once the level got to a certain point.

The customer doesn’t need to know how much is in the tank, they just need to know when it’s time to empty it out!

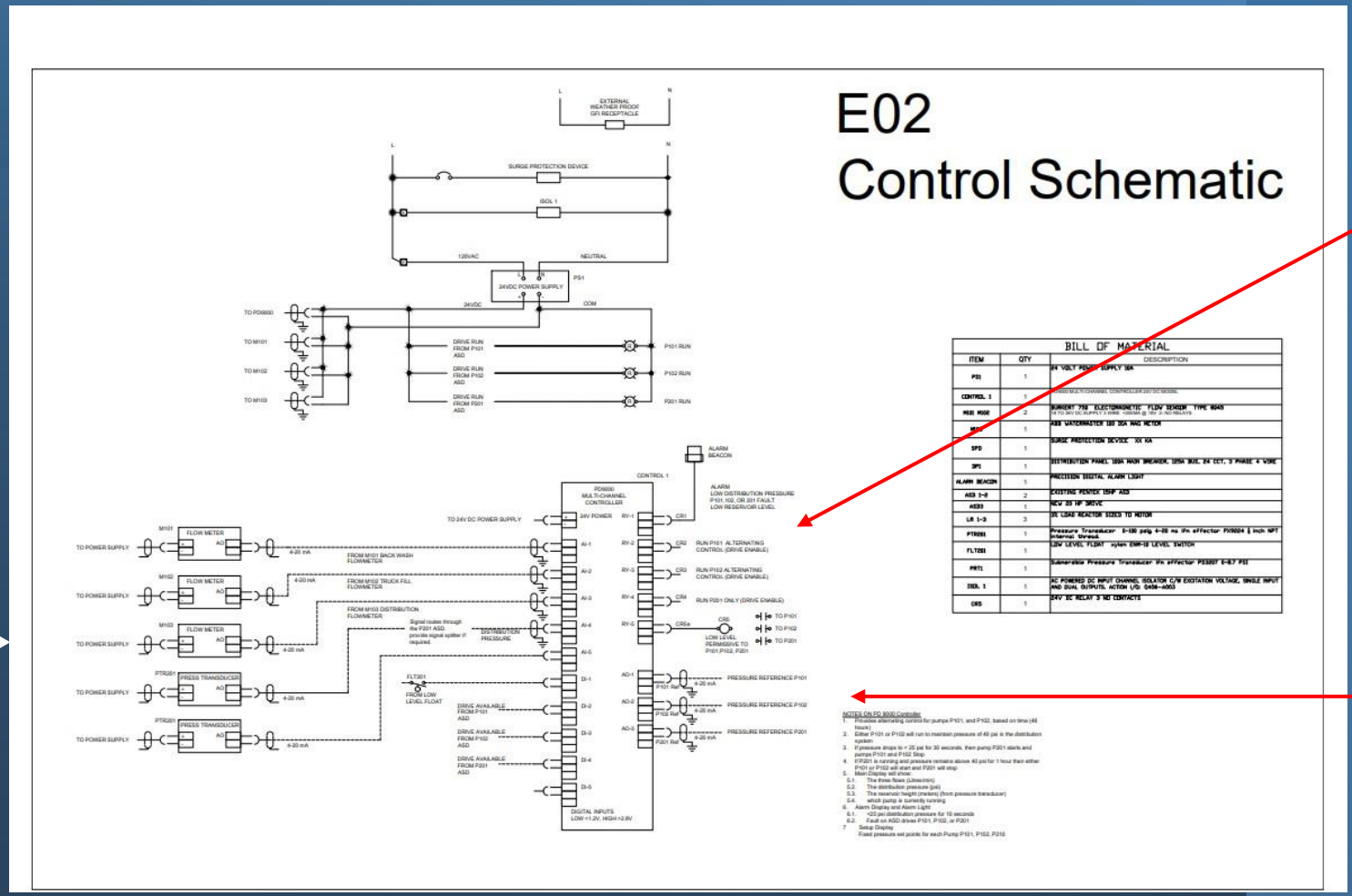


But, why didn’t our “Feed Tank” channel change color like our “Unknown Tank” did?

Well, each “Alarm” can be programmed to change color or not. It is totally up to the individual operator.

In this case, maybe it’s not a big deal if the “Feed Tank” overfills.

Actual ConsoliDator+ Level Control Application



5 pressure transducers, measuring level, are being powered by the ConsoliDator+

Relays (10 amps) being used for high level alarm AND pump control…

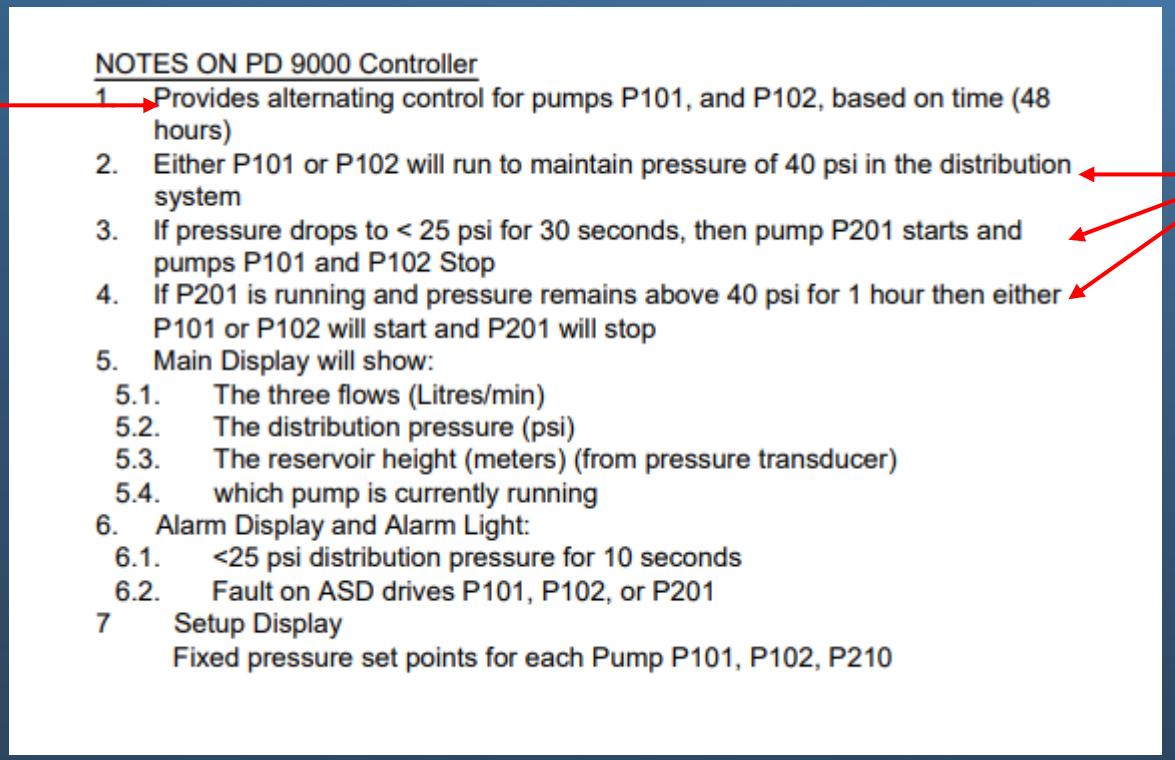
And this is where it gets interesting!

Powered analog outputs being brought to a “cloud” device for remote monitoring of the level readings

Actual ConsoliDator+ Level Control Application

Remember how we can alternate pumps based on elapsed time??

In this application, the customer wants to alternate their pumps every 48 hours, rather than based on process conditions



NOTES ON PD 9000 Controller

1. Provides alternating control for pumps P101, and P102, based on time (48 hours)
2. Either P101 or P102 will run to maintain pressure of 40 psi in the distribution system
3. If pressure drops to < 25 psi for 30 seconds, then pump P201 starts and pumps P101 and P102 Stop
4. If P201 is running and pressure remains above 40 psi for 1 hour then either P101 or P102 will start and P201 will stop
5. Main Display will show:
   - 5.1. The three flows (Litres/min)
   - 5.2. The distribution pressure (psi)
   - 5.3. The reservoir height (meters) (from pressure transducer)
   - 5.4. which pump is currently running
6. Alarm Display and Alarm Light:
   - 6.1. <25 psi distribution pressure for 10 seconds
   - 6.2. Fault on ASD drives P101, P102, or P201
7. Setup Display
   Fixed pressure set points for each Pump P101, P102, P210

Now, the pumps will continue to alternate every 48 hours, unless certain process conditions are met.

In this case, they don't want the pumps running if the pressure in their system is too high, or too low

This requires a bit of logic programming with the ConsoliDator+ which is completely doable!

This application would **NOT** be possible with **ANY** other Precision Digital product. That is why the ConsoliDator+ is such a powerful device!